

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
6 May 2004 (06.05.2004)

PCT

(10) International Publication Number
WO 2004/037713 A1

(51) International Patent Classification⁷: **B81C 1/00**

(21) International Application Number:
PCT/TB2003/004586

(22) International Filing Date: 17 October 2003 (17.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02079467.3 24 October 2002 (24.10.2002) EP

(71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VAN BEEK, Jozef, T., M.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). **VAN GROOTEL, Margot** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(74) Agent: **DUIJVESTIJN, Adrianus, J.**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

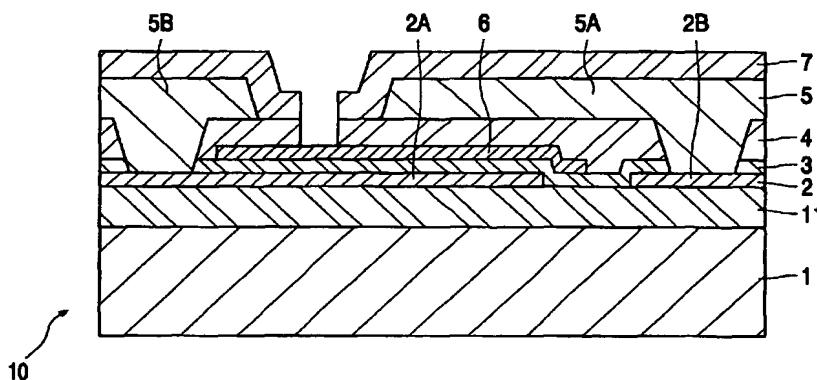
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,

[Continued on next page]

(54) Title: METHOD FOR MANUFACTURING A MICRO-ELECTROMECHANICAL DEVICE AND MICRO-ELECTRO-MECHANICAL DEVICE OBTAINED THEREWITH



(57) Abstract: The invention relates to a method of manufacturing a micro-electromechanical device (10), in which are consecutively deposited on a substrate (1) a first electroconductive layer (2) in which an electrode (2A) is formed, a first electroinsulating layer (3) of a first material, a second electroinsulating layer (4) of a second material different from the first material, and a second electroconductive layer (5) in which a second electrode (5A) lying opposite the first electrode is formed which together with the first electrode (2A) and the first insulating layer (3) forms the device (10), in which after the second conductive layer (5) has been deposited, the second insulating layer (4) is removed by means of an etching agent which is selective with respect to the material of the second conductive layer (5). According to the invention for the first material and the second material materials are selected which are only limitedly selectively etchable with respect to each other and before depositing the second insulating layer (4) a further layer (6) is provided on top of the first insulating layer (3) of a further material that is selectively etchable with respect to the first material. In this way a silicon oxide and a silicon nitride may be applied for the insulating layers (3, 4) and thus the method according to the invention is very compatible with current IC processes. The second insulating layer (4) is preferably removed locally by etching, then the further layer (6) is completely removed by etching and, finally, the second insulating layer (4) is completely removed by etching.